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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,928	10/21/2005	Shojiro Kaita	1261-0157PUS1	7600

2292 7590 12/18/2007
BIRCH STEWART KOLASCH & BIRCH
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EXAMINER	
LEE, RIP A	
ART UNIT	**PAPER NUMBER**
1796	

NOTIFICATION DATE	DELIVERY MODE
12/18/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/518,928	KAITA ET AL.	
	Examiner	Art Unit	
	Rip A. Lee	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *October 10, 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,6,8 and 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,6,8 and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action follows a response filed on October 10, 2007. Claims 1, 2, 6, 8, and 12 are pending. Claims 7 and 9-11 remain withdrawn. The indicated allowability of claims has been withdrawn due to reconsideration of claimed subject matter in view of newly discovered references.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 2, 8, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wenzel *et al.* (U.S. 5,744,415).

Wenzel *et al.* discloses a catalyst comprising a samarocene complex whose structure is shown in claim 5. The co-catalyst is triisobutylaluminum, diisobutylaluminum hydride, and methylaluminoxane (claim 4). While the reference does not show a catalyst comprised of the three co-activators listed in claim 4, it is within the level of ordinary skill in the art to use combinations of activator in order to generate a stable and active catalyst. Hence, the choice of a particular combination of co-activator is a matter of routine experimentation and would have

been well within the skill level of, and thus obvious to, one of ordinary skill in the art. Moreover, it is well settled that the combination of two materials, each of which is taught by prior art to be useful for the same purpose, in order to form a composition comprising the two materials that is to be used for the very same purpose is *prima facie* obvious. And since each member of the combination is known individually to perform the same chemical function, and the person with ordinary skill in the art would have expected such a combination to work. *In re* Susi, 440 F.2d 442, 445, 169 USPQ 423, 426 (CCPA 1971), *In re Kerkhoven*, 205 USPQ 1069, 1072 (CCPA 1980); *In re Lindner*, 173 USPQ 356, 359 (CCPA 1972). Catalysts are useful for preparing polymers of conjugated diene (col. 5, line 63-65 and col. 6, line 6). Regarding claim 12, it would have been obvious to one having ordinary skill in the art, absent any showing of criticality or unexpected results to incorporated further co-catalyst such as dibutyl magnesium or butyllithium, as disclosed in claim 5 of Wenzel *et al.*

4. Claims 1, 2, 6, 8, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaita *et al.* (WO 00/52062; equivalent U.S. 7,196,031 relied upon for translation) in view of Muruganandam *et al.* (U.S. 6,441,107) and Aldrich Catalogue (1996-1997).

Kaita *et al.* teaches a catalyst composition comprising a metallocene-type complex of a rare earth metal such as samarium, an ionic compound composed of a non-coordinating anion and a cation and aluminoxane for producing high *cis*-1,4-polybutadiene (abstract). Other embodiments of the invention are described in the specification. Aluminoxanes produced by using a mixture of Me_3Al and iBu_3Al may be suitably used (in this case, two types of group III compounds are present), and aluminoxanes may be used in combination with ionic compounds (col. 7, lines 21-24). The catalyst may further contain organometallic compounds selected from organic aluminum compounds (iBu_3Al, Me_3Al, Et_3Al) and hydrogenated organometallic compounds (Et_2AlH); see col. 7, lines 25-44. Two or more organometallic compounds may be used (col. 7, line 45).

Kaita *et al.* notably teaches use of diethylaluminum hydride (Et_2AlH) as co-catalyst. One having ordinary skill in the art, following the teaching in the patent, would find that this material is not readily available (Aldrich Catalogue, page 506-507). However, one having skill in the art knows that the diisobutylaluminum hydride (iBu_2AlH), is commercially available, as shown in

Aldrich Catalogue, page 540-550. One having ordinary skill in the art would have found it obvious to use iBu$_2$AlH in place of Et$_2$AlH because the former can be obtained readily. A *prima facie* case of obviousness may be made when chemical compounds have very close structural similarities and similar utilities. An obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to use the compound, in the expectation that compounds similar in structure will have similar properties. *In re Payne*, 606 F.2d 303, 313, 203 USPQ 245, 254 (CCPA 1979).

One having ordinary skill in the art, also would have found it obvious to make the substitution of iBu$_2$AlH in place of Et$_2$AlH in view of the prior art of Muruganandam *et al.* The patent also teaches use of rare earth catalysts for diene polymerization, and one finds that the co-catalyst is a combinaiton of iBu$_3$Al and Et$_2$AlH (examples). Thus, the skilled artisan would have expected use of iBu$_2$AlH in place of Et$_2$AlH to work with a high expectation of success.

While Kaita *et al.* does not show examples of catalysts comprising the claimed co-activators, it is within the level of ordinary skill in the art to use combinations of activator in order to generate a stable and active catalyst. In fact, Muruganandam *et al.* teaches that the polymerization process may be controlled by adjusting appropriately the selection of co-catalysts (claim 1, col. 20, line 20). Hence, the choice of a particular combination of co-activator is a matter of routine experimentation and would have been well within the skill level of, and thus obvious to, one of ordinary skill in the art. Moreover, it is well settled that the combination of two materials, each of which is taught by prior art to be useful for the same purpose, in order to form a composition comprising the two materials that is to be used for the very same purpose is *prima facie* obvious. And since each member of the combination is known individually to perform the same chemical function, and the person with ordinary skill in the art would have expected such a combination to work. *In re* Susi, 440 F.2d 442, 445, 169 USPQ 423, 426 (CCPA 1971), *In re Kerkhoven*, 205 USPQ 1069, 1072 (CCPA 1980); *In re Lindner*, 173 USPQ 356, 359 (CCPA 1972).

In summary, it is concluded that one having ordinary skill in the art would have found it obvious to make the catalyst of the instant claims based on the combination of Kaita *et al.*, Muruganandam *et al.*, and Aldrich Catalogue.

5. Claims 1, 2, 6, 8, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kaita *et al.* (WO 01/77199; equivalent U.S. 6,960,631 relied upon for translation) in view of Muruganandam *et al.* (U.S. 6,441,107) and Aldrich Catalogue (1996-1997).

Kaita *et al.* teaches a catalyst composition comprising a metallocene-type complex of a rare earth metal such as neodymium, an ionic compound composed of a non-coordinating anion and a cation and aluminoxane for producing high *cis*-1,4-polybutadiene (abstract). Other embodiments of the invention are described in the specification. Aluminoxanes produced by using a mixture of Me_3Al and iBu_3Al may be suitably used (in this case, two types of group III compounds are present), and aluminoxanes may be used in combination with ionic compounds (col. 7, lines 35-54). The catalyst may further contain combinations of organometallic compounds selected from organic aluminum compounds (iBu_3Al, Me_3Al, Et_3Al) and hydrogenated organometallic compounds (Et_2AlH); see claim 17.

Kaita *et al.* notably teaches use of diethylaluminum hydride (Et_2AlH) as co-catalyst. One having ordinary skill in the art, following the teaching in the patent, would find that this material is not readily available (Aldrich Catalogue, page 506-507). However, one having skill in the art knows that the diisobutylaluminum hydride (iBu_2AlH), is commercially available, as shown in Aldrich Catalogue, page 540-550. One having ordinary skill in the art would have found it obvious to use iBu_2AlH in place of Et_2AlH because the former can be obtained readily. A *prima facie* case of obviousness may be made when chemical compounds have very close structural similarities and similar utilities. An obviousness rejection based on similarity in chemical structure and function entails the motivation of one skilled in the art to use the compound, in the expectation that compounds similar in structure will have similar properties. *In re Payne*, 606 F.2d 303, 313, 203 USPQ 245, 254 (CCPA 1979).

One having ordinary skill in the art, also would have found it obvious to make the substitution of iBu_2AlH in place of Et_2AlH in view of the prior art of Muruganandam *et al.* The patent also teaches use of rare earth catalysts for diene polymerization, and one finds that the co-catalyst is a combinaiton of iBu_3Al and Et_2AlH (examples). Thus, the skilled artisan would have expected use of iBu_2AlH in place of Et_2AlH to work with a high expectation of success.

While Kaita *et al.* does not show examples of catalysts comprising the claimed co-activators, it is within the level of ordinary skill in the art to use combinations of activator in order to generate a stable and active catalyst. In fact, Muruganandam *et al.* teaches that the polymerization process may be controlled by adjusting appropriately the selection of co-catalysts (claim 1, col. 20, line 20). Hence, the choice of a particular combination of co-activator is a matter of routine experimentation and would have been well within the skill level of, and thus obvious to, one of ordinary skill in the art. Moreover, it is well settled that the combination of two materials, each of which is taught by prior art to be useful for the same purpose, in order to form a composition comprising the two materials that is to be used for the very same purpose is *prima facie* obvious. And since each member of the combination is known individually to perform the same chemical function, and the person with ordinary skill in the art would have expected such a combination to work. *In re* Susi, 440 F.2d 442, 445, 169 USPQ 423, 426 (CCPA 1971), *In re Kerkhoven*, 205 USPQ 1069, 1072 (CCPA 1980); *In re Lindner*, 173 USPQ 356, 359 (CCPA 1972).

In summary, it is concluded that one having ordinary skill in the art would have found it obvious to make the catalyst of the instant claims based on the combination of Kaita *et al.*, Muruganandam *et al.*, and Aldrich Catalogue.

Response to Arguments

6. Claims 1-4, 6, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Kaita *et al.* (WO 00/52062/U.S. 7,196,031) has been overcome by amendment.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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December 13, 2007